



Digital Forensics

Objectives

Upon Completion of this course the student will be able to:

- 1 Perform the steps included in a digital investigation from the initial recognition of an incident through the steps of evidence gathering, preservation and analysis, and the completion of legal proceedings;
- 2 Identify important file metadata and apply their use in a forensic investigation;
- 3 Perform a forensic investigation on a forensic image, using various tools to recover evidence, resulting in a report documenting the investigation;
- 4 Write professional quality reports that include both a summary report.



Digital Forensic: Cycle II

Course Developed

by

Uttarakhand Open University, Haldwani

With support

of

Commonwealth Educational Media Centre for Asia,

New Delhi

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COURSE DESCRIPTION

Computer forensics, or digital forensics, is a fairly new field. Computer forensics investigators, also known as computer forensics specialists, computer forensics examiners, or computer forensics analysts, are charged with uncovering and describing the information contained on, or the state or existence of, a digital artifact. Digital artifacts include computer systems, hard drives, CDs, and other storage devices, as well as electronic documents and files like emails and JPEG images. The fast-growing field of computer forensics includes several branches related to firewalls, networks, databases, and mobile devices. Digital forensics technicians can find work with many types of organizations: government (local, state, and federal), accounting firms, law firms, banks, and software development companies. Essentially, any kind of organization that has a computer system may have a need for a digital forensics specialist. Some digital forensics specialists opt to start their own businesses, giving them an opportunity to work with a variety of clients. Computer forensics investigators provide many services based on gathering digital information, from investigating computer systems and data in order to present information for legal cases to determining how an unauthorized user hacked into a system. A digital forensics examiner does many things in the course of these tasks – protects the computer system, recovers files (including those that were deleted or encrypted), analyses data found on various disks, and provides reports, feedback, and even testimony when required. The employment outlook for digital forensics examiners and investigators is favorable due to the rapid growth of crimes involving computers (cybercrime).

LEARNING OUTCOMES

After the successful completion of this course, the learner will be able to:

- A. Understand the importance of a systematic procedure for investigation of data found on digital storage media that might provide evidence of wrong-doing.
- B. Understand the file system storage mechanisms of the operating systems.
- C. Use tools for faithful preservation of data on disks for analysis.
- D. Find data that may be clear or hidden on a computer disk.
- E. Learn the use of computer forensics tools used in data analysis, such as searching, absolute disk sector viewing and editing, recovery of files, password cracking, etc.
- F. Understand how to present the results of disk data analysis in a court proceeding as an expert witness.

CERTIFICATE

A completion certificate issued jointly by UOU and CEMCA will be available based on your level of participation and completion of tasks/activities: requires 60% on each quiz and participation in discussion forum.

DURATION AND MEDIUM

It's a 4 Weeks course which is offered in English.

INSTRUCTORS

Dr. Akashdeep Bharadwaj, Professor, University of Petroleum and Energy Studies, Dehradun	Dr. Jeetendra Pande, Associate Professor-Comp. Sc. & Dy. Director, Online Program Cell, Uttarakhand Open University, Haldwani
Gp. Cap.(Er) Ashok Kumar, Indian Air Force, New Delhi	Dr. Sangram Panigrahi, Assistant Professor-Computer Science, Siksha 'O' Anusandhan, Deemed to be University, Bhubaneswar-751030, Odisha, India
Mr. Rishikesh Ojha, Team Lead-eDiscovery, UnitedLex Corporation, USA	Mr. Sridhar Chandrmohan Iyer, Assistant Professor- Computer Science, Universal College of Engineering, Vasai, Maharashtra

COURSE DESIGNER AND COORDINATOR

Dr. Jeetendra Pande

Associate Professor- Computer Science,

School of Computer Science & IT

Uttarakhand Open University, Haldwani E-mail: jpande@uou.ac.in

ORIENTATION OF THE MENTORS AND THE INSTRUCTORS

An online orientation session for all the instructors and the mentors was conducted on 22 November, 2021 at 11:00 am. All the course mentors attended the orientation program. Dr. Jeetendra Pande, the course coordinator of the online training program briefed about the UOU's MOODLE based LMS through which the course is offered. He also informed that four online live discussion sessions are also planned on weekends. The experts advised to conduct the live session at evening hours keeping the engagement of the participants in the day hours. The login credentials were shared with the experts and mentors via email.

DETAILS ABOUT THE COURSES

UOU offered 4-week online training program from *22 November to 20 December, 2021* through MOODLE platform. Course materials were designed and developed by Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University and his team. The content includes video lectures, power point presentation, transcripts, etc. were uploaded and placed in the sequential manner and provided navigation for easy access. Details about the course are given below:

TABLE 1: COURSE DETAILS

Courses	Start Date	End Dates	No of Modules	No of Instructors
Digital Forensics	22-11-2021	20-12-2021	20	6

Participants Registration and Participation

Initially, UOU announces the courses details in the University website, Social Media platforms like Facebook, LinkedIn, etc. and invited the participants for registration through google form. Total 897 participants registered for the online training program on Digital Forensics. To facilitate the registration on the course portal, the organizers created the login for the participants and the credentials were sent to them along with instruction through registered email. Out of total 897 applications, 512 participants registered for the course on the course portal. 385 participants never logged in to the portal after registration. So, there were 512 participants who registered for the course and logged in to the course portal for at least once.

Gender

It is evident that out of 897 participants, 661(73.7%) were male, 231(25.8%) were female and 5(0.6%) participants preferred not to disclose their gender. This reveals that more male participants registered in the course as compared to the female participants.

You are

897 responses

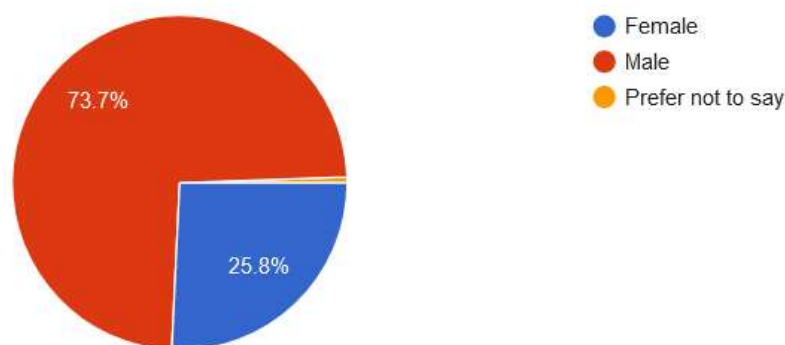


FIGURE 1: SHOWS PERCENTAGE OF MALE AND FEMALE PARTICIPANTS

MONITORING THE PROGRESS OF PARTICIPANTS USING LOG REPORT OF MOODLE

Log Report of MOODLE shows activity within the course. It allows teachers to see what course material and activity are being used and when by the participants. For example, a teacher can check that an individual participant has viewed the course material for that week or topic they declare to have read, and how long. This helps the teacher to monitor the participants and motivate them to take part in the course. The log reports of the 4-week online training program on Digital Forensics offered by the UOU and CEMCA have analyzed and the data are given in the following sections.


Learning Objectives viewed by the Participants

Learning objectives are statements which describe the expected outcome of a curriculum, course, lesson or activity in terms of demonstrable skills or knowledge that will be acquired by the participants after completing the course. The figure shows that the number of participants accessed the learning objectives of the online training program which was listed under the Announcement. There is total 733 views by 228 users. It is important that the participants should view the learning objectives to know the outcomes of the course.



Course materials viewed by the participants

Course materials are most essential component for online courses. Participants learn from this content to enrich themselves. The content should be interesting as the teacher is away from them. Since the course access through devices, the content should be enriching with multimedia component to retain the attention of the participants. This course has 20 modules arranged in 84 topics and has videos, pdf of transcript and ppt files for content. The participants have accessed the content to learn the course. The first module of the online training program is “Introduction to Digital Forensics” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. The details of the total views of the video lecture by the users is given below.



A screenshot of a Moodle course page titled "Introduction to Digital Forensics". It displays a list of course materials with their respective view counts and user numbers. The materials are:

Material Name	Views	Users	Date/Time
Definition of Computer Forensics	836	306	Saturday, 25 December 2021, 8:20 PM (3 days 19 hours)
Cyber Crime	407	255	Saturday, 25 December 2021, 8:04 PM (3 days 19 hours)
Evolution of Computer Forensics	337	226	Saturday, 25 December 2021, 9:07 PM (3 days 19 hours)
Objectives of Computer Forensics	270	202	Saturday, 25 December 2021, 11:40 PM (3 days 18 hours)
Roles of Forensics Investigator	250	197	Saturday, 25 December 2021, 11:44 PM (3 days 18 hours)
Forensics Readiness	247	150	Saturday, 25 December 2021, 11:44 PM (3 days 18 hours)
Steps for Forensics	274	185	Saturday, 25 December 2021, 11:45 PM (3 days 18 hours)
Introduction to Digital Forensics (text)	411	194	Saturday, 25 December 2021, 5:13 PM (4 days 1 hour)

The second module is “Computer Forensics Investigation Process” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. There is total 5 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Computer Forensics Investigation Process			
Computer Forensics Investigation Process	263 views by 172 users	-	Sunday, 26 December 2021, 8:43 AM (3 days 7 hours)
Computer Forensics Investigation Process-Assessment Phase	240 views by 166 users	-	Saturday, 25 December 2021, 11:43 PM (3 days 16 hours)
Acquire the Data	211 views by 154 users	-	Saturday, 25 December 2021, 11:43 PM (3 days 16 hours)
Analyze the Data	195 views by 154 users	-	Saturday, 25 December 2021, 11:43 PM (3 days 16 hours)
Report the Investigation	188 views by 151 users	-	Saturday, 25 December 2021, 11:43 PM (3 days 16 hours)
Computer Forensics Investigation Process(e-text)	270 views by 139 users	-	Saturday, 25 December 2021, 3:14 PM (4 days 1 hour)

The third module is “Digital Evidence and First Responder Procedure” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. There is total 4 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Digital Evidence and First Responder Procedure			
Digital Evidence	202 views by 149 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Digital Evidence Investigation Process	184 views by 149 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
First Responders Toolkit	167 views by 148 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Issues Facing Computer Forensics	168 views by 148 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Digital Evidence and First Responder Procedure(e-text)	223 views by 125 users	-	Saturday, 25 December 2021, 3:14 PM (4 days 1 hour)

The fourth module is “Types of Investigation” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. There is total 2 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Types of Investigation			
Types of Investigation	170 views by 146 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Techniques in digital forensics	171 views by 145 users	-	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Types of Investigation(e-text)	217 views by 128 users	-	Saturday, 25 December 2021, 3:14 PM (4 days 1 hour)













The fifth module is “Understanding Storage Media” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. There is total 4 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Understanding Storage Media		
The Booting Process	196 views by 145 users	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
LINUX Boot Process	169 views by 144 users	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Mac OS Boot Sequence	172 views by 144 users	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Windows 10 Booting Sequence	170 views by 144 users	Saturday, 25 December 2021, 11:46 PM (3 days 16 hours)
Understanding Storage Media(e-text)	235 views by 133 users	Saturday, 25 December 2021, 3:33 PM (4 days)
Link for First Live Session: 27 Nov., 2021 at 06:00 PM	79 views by 60 users	Saturday, 25 December 2021, 8:05 PM (3 days 20 hours)

The sixth module is “Understanding File System” and the instructor for this module is Dr. Jeetendra Pande, Associate Professor- Computer Science, Uttarakhand Open University, Haldwani. There is total 2 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.








Understanding File System		
File System	167 views by 135 users	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
Type of File Systems	166 views by 134 users	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
Understanding File System(e-text)	203 views by 115 users	Saturday, 25 December 2021, 8:06 PM (3 days 20 hours)

The seventh module is “Windows Forensics” and the instructor for this module are Dr. Ajay Prasad, Sr. Astt Professor, University of Petroleum and Energy Studies, Dehradun and Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai. There is total 11 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Windows Forensics			
 Introduction to Windows Forensics	179 views by 135 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Windows Forensics Volatile Information	188 views by 133 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Windows Forensics Non- Volatile Information	167 views by 131 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Recovering deleted files and partitions	158 views by 131 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Windows Forensics Summary	153 views by 131 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Digital Forensics Road map: Static Data Acquisition from windows using FTK Imager	162 views by 130 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Live Data Acquisition using FTK Imager	155 views by 129 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 FTK Imager	157 views by 127 users	-	Saturday, 25 December 2021, 11:56 PM (3 days 16 hours)
 Installation of KALI Linux	155 views by 127 users	-	Saturday, 25 December 2021, 11:57 PM (3 days 16 hours)
 RAM Dump Analysis using Volatility	161 views by 127 users	-	Saturday, 25 December 2021, 11:57 PM (3 days 16 hours)
 Static Data Acquisition from Linux OS	156 views by 126 users	-	Saturday, 25 December 2021, 11:57 PM (3 days 16 hours)
 Windows Forensics(e-text)	193 views by 115 users	-	Saturday, 25 December 2021, 11:57 PM (3 days 16 hours)

The eighth module is “Recovering Deleted Files and Partitions” and the instructor for this module are Dr. Akashdeep Bharadwaj, Professor, University of Petroleum and Energy Studies, Dehradun, Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai and Mr. Rishikesh Ojha, Forensics Expert from Industry. There is total 6 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Recovering Deleted Files and Partitions

 Recovering Deleted Files and Partitions	156 views by 126 users	-	Saturday, 25 December 2021, 11:58 PM (3 days 16 hours)
 Windows Forensics Summary	145 views by 125 users	-	Saturday, 25 December 2021, 11:58 PM (3 days 16 hours)
 Digital Forensics Tools	160 views by 126 users	-	Saturday, 25 December 2021, 11:58 PM (3 days 16 hours)
 Overview of EnCase Forensics	141 views by 125 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
 Deep Information Gathering Tool: Dmity	142 views by 124 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
 Computer Forensics Live Practical by using Autopsy and FTK Imager	146 views by 124 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
 Recovering Deleted Files and Partitions(e-text)	190 views by 110 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)

The ninth module is “Network Forensics” and the instructor for this module is Dr. Ajay Prasad, Sr. Asst. Professor, University of Petroleum and Energy Studies, Dehradun. Some of the videos(The Difference Between Hubs, Bridges, Switches and Gateways; 7 Layers of OSI Model), which are available under Creative Commons Licenses, are adopted from Youtube. There is total 6 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Network Forensics

 Introduction to Network Forensics	143 views by 124 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
 Network Components and their forensic importance	138 views by 123 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
 The Difference Between Hubs, Bridges, Switches and Gateways (Backbones)	136 views by 122 users	-	Saturday, 25 December 2021, 8:06 PM (3 days 20 hours)
 7 Layers of OSI Model	141 views by 122 users	-	Saturday, 25 December 2021, 8:06 PM (3 days 20 hours)
 OSI internet Layers and their Forensic importance	135 views by 121 users	-	Saturday, 25 December 2021, 8:06 PM (3 days 20 hours)
 Tools Introduction Wireshark and TCPDUMP	142 views by 120 users	-	Saturday, 25 December 2021, 8:07 PM (3 days 20 hours)
 Network forensics(e-text)	197 views by 108 users	-	Saturday, 25 December 2021, 8:07 PM (3 days 20 hours)

The tenth module is “Network Log Analysis and Forensic Tools” and the instructor for this module is Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai. There is total 5 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Network Log Analysis and Forensics Tools			
Packet Sniffing and Analysis using Ettercap and Wireshark	145 views by 117 users	-	Saturday, 25 December 2021, 11:59 PM (3 days 16 hours)
Network Forensics	139 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Wireshark Packet Analyzer	139 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Packet Capture using TCP DUMP	136 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Website Penetration: WHOIS, nslookup	130 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Network Log Analysis and Forensics Tools	169 views by 97 users	-	Saturday, 25 December 2021, 8:07 PM (3 days 20 hours)

The eleventh module is “Log and Event Analysis” and the instructor for this module are Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai and Dr. Ajay Prasad, Sr. Astt. Professor, University of Petroleum and Energy Studies, Dehradun. One of the video (Practical Windows Registry Expiation), which are available under Creative Commons Licenses, is adopted from Youtube. There is total 6 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Logs & Event Analysis			
Practical Windows Registry Explanation	135 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Forensic Analysis using AUTOPSY: Linux and Windows	138 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Forensics and Log analysis	135 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Compare and AUDIT Evidences using Hashdeep	133 views by 116 users	-	Sunday, 26 December 2021, 12:00 AM (3 days 16 hours)
Data Carving using Bulk Extractor: Kali Linux and Windows	130 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
Recovering Evidence from Forensic Images using Foremost	131 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
Logs & Event Analysis(e-text)	174 views by 101 users	-	Saturday, 25 December 2021, 8:07 PM (3 days 20 hours)

The twelfth module is “Application Password Cracking” and the instructor for this module are Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai and Mr. Rishikesh Ojha. One of the video(Common Password threats), which are available under Creative Commons Licenses, is adopted from Youtube. There is total 6 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Application Password Cracking

 Introduction to Password Cracking	144 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Common Password Threats	134 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Password Cracking using John the Ripper	136 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Password Cracking using Rainbow Tables	132 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 PDF File Analysis	135 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Remote Imaging using E3 Digital Forensics	140 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Application Password Cracking(e-text)	156 views by 97 users	-	Saturday, 25 December 2021, 8:08 PM (3 days 20 hours)

The thirteenth module is “Wireless Attacks” and the instructor for this module is Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai. There is total 1 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Wireless Attacks

 WiFi Packet Capture and Password Cracking using Aircrack-ng	137 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Wireless Attacks(e-text)	149 views by 95 users	-	Saturday, 25 December 2021, 8:08 PM (3 days 20 hours)









The fourteenth module is “Web Attacks” and the instructor for this module is Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai. There is total 1 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Web Attacks

 Introduction to Web Attacks	133 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Web Attacks(e-text)	148 views by 97 users	-	Saturday, 25 December 2021, 8:08 PM (3 days 20 hours)

The fifteenth module is “Web Attack Forensics” and the instructor for this module is Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai. There is total 7 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Web Attacks Forensics

 Website Copier: HTTRACK	129 views by 116 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 SQL Injection	133 views by 116 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Site Report Generation: Netcraft	128 views by 115 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Vulnerability Analysis: Nikto	131 views by 115 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Wayback Machine	127 views by 115 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Deep Information Gathering Tool: Dmitry	133 views by 115 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Image Metadata Extraction using Imago	132 views by 115 users	-	Sunday, 26 December 2021, 12:02 AM (3 days 16 hours)
 Web Attack Forensics(e-text)	167 views by 99 users	-	Saturday, 25 December 2021, 8:08 PM (3 days 20 hours)

The sixteenth module is “Electronics Mail” There is total 3 video lectures and 1 e-text file in this module. All the videos (Understanding Email Headers, How to analyze headers using MXtoolbox.com and Email Header Analysis), which are available under Creative Commons Licenses, is adopted from Youtube. The e-text for this module is developed by Dr. Sangram Panigrahi, Assistant Professor, Siksha 'O' Anusandhan, Bhubaneswar. The details of the total views of the video lecture by the users is given below.

Electronic Mail

 Understanding Email Headers	134 views by 109 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 How to analyze headers using MXtoolbox.com	133 views by 109 users	-	Sunday, 26 December 2021, 12:01 AM (3 days 16 hours)
 Email Header Analysis	123 views by 109 users	-	Sunday, 26 December 2021, 12:03 AM (3 days 16 hours)
 Electronics Mail(e-text)	130 views by 86 users	-	Saturday, 25 December 2021, 8:08 PM (3 days 20 hours)

The seventeenth module is “Investigating E-Mail Attacks” and the instructor for this module is Dr. Akashdeep Bharadwaj, Professor, University of Petroleum and Energy Studies, Dehradun. There is total 1 video lecture and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Email Forensics Investigation		
Email Forensics Investigations	135 views by 109 users	Sunday, 26 December 2021, 12:04 AM (3 days 16 hours)
Investigating E-Mail Attacks(e-text)	137 views by 87 users	Saturday, 25 December 2021, 8:09 PM (3 days 20 hours)

The eighteenth module is “Mobile Device Forensics” and the instructor for this module are Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai and Mr. Rishikesh Ojha. There is total 2 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Mobile Device Forensics		
Mobile Forensics	132 views by 109 users	Sunday, 26 December 2021, 12:04 AM (3 days 16 hours)
Preparation for Digital Forensics Investigation	217 views by 112 users	Sunday, 26 December 2021, 12:04 AM (3 days 16 hours)
Mobile Device Forensics(e-text)	172 views by 94 users	Saturday, 25 December 2021, 8:09 PM (3 days 20 hours)

The nineteenth module is “Investigative reports, expert witness and cyber regulations” and the instructor for this module are Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai and Dr. Akashdeep Bharadwaj, Professor, University of Petroleum and Energy Studies, Dehradun. There is total 2 video lectures and 1 e-text file in this module. The details of the total views of the video lecture by the users is given below.

Investigative reports, expert witness and cyber regulations		
Introduction to Report Writing	138 views by 110 users	Sunday, 26 December 2021, 12:04 AM (3 days 16 hours)
Forensic Reports & Expert Witness	134 views by 110 users	Sunday, 26 December 2021, 12:04 AM (3 days 16 hours)
Investigative reports, expert witness and cyber regulations(e-text)	167 views by 97 users	Saturday, 25 December 2021, 8:09 PM (3 days 20 hours)

The twentieth module is “Practical Handbook” with contains demonstration video lectures of the various aspects of Digital Forensics. These videos are jointly developed by Mr. Sridhar Chandramohan Iyer, Assistant Professor, Universal College of Engineering, Mumbai, Mr. Rishikesh Ojha, Mr. Ketan Joglekar, Assistant Professor, GJ College, Maharashtra. The details of the total views of the video lecture by the users is given below.

Practical Handbook		
Practical Handbook	315 views by 128 users	Sunday, 26 December 2021, 12:16 AM (3 days 16 hours)

Activities Completed by the Participants

Both synchronous and asynchronous activities should incorporate in the online course to encourage the participants to interact with peer group as well teachers. The following table shows the activities such as discussion forum and chat completed by the participants. It is appreciated that the participants were participated the chat which was live activity facilitate to interact with peer and teacher.

Participation in Asynchronous Discussion forum

There are 123 unique threads created by the participants which are answered by mentors, instructors and other participants. The discussion forum has 2855 views by 316 users.

Participation in Live Synchronous Discussion forum

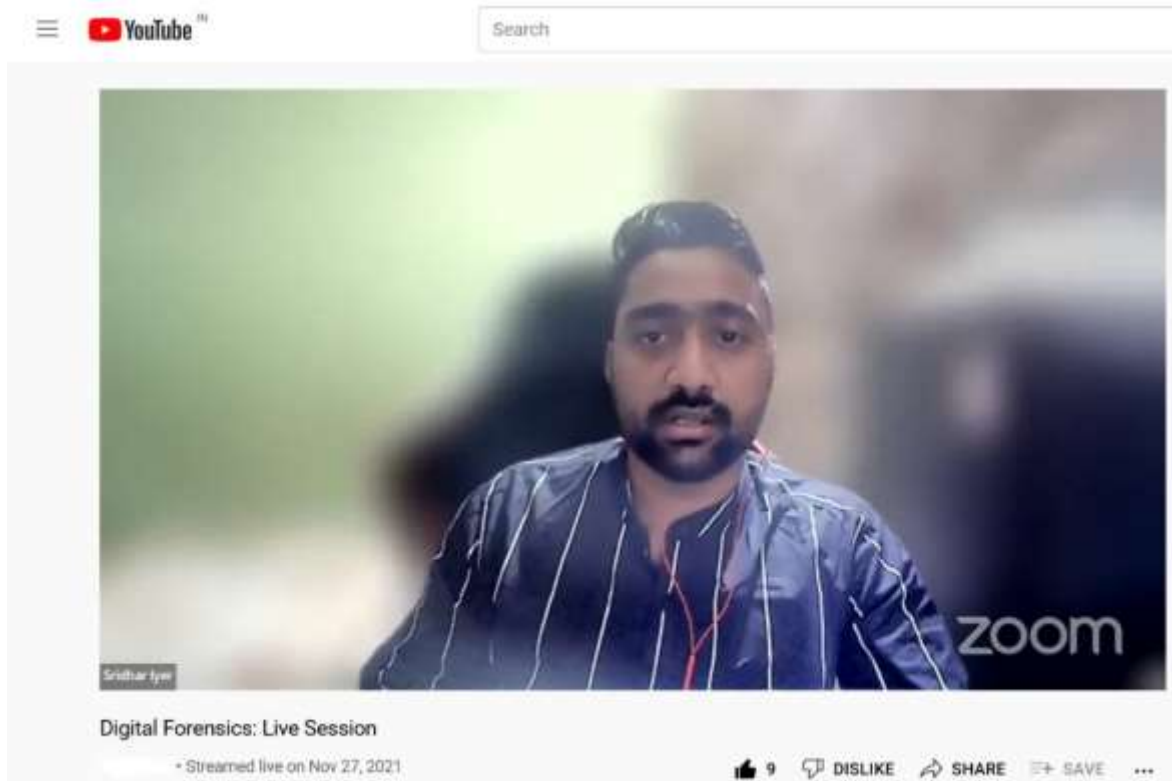
Four live sessions were conducted on:

1. 27th November, 2021 at 18:00 Hrs,
2. 4th December, 2021 at 18:00 Hrs.
3. 11th December, 2021 at 18:00 Hrs, and
4. 18th December, 2021 at 18:00 Hrs.

These sessions were conducted through ZOOM sessions and were attended by 250+ participants and the following experts were present online to answer the queries of the participants.

1. Dr. Jeetendra Pande, UOU
2. Dr. Akashdeep Bharadwaj
3. Gp. Cap. Ashok Kumar
4. Dr. Sangram Panigrahi
5. Mr. Sridhar Chandramohan Iyer
6. Mr. Rishikesh Ojha

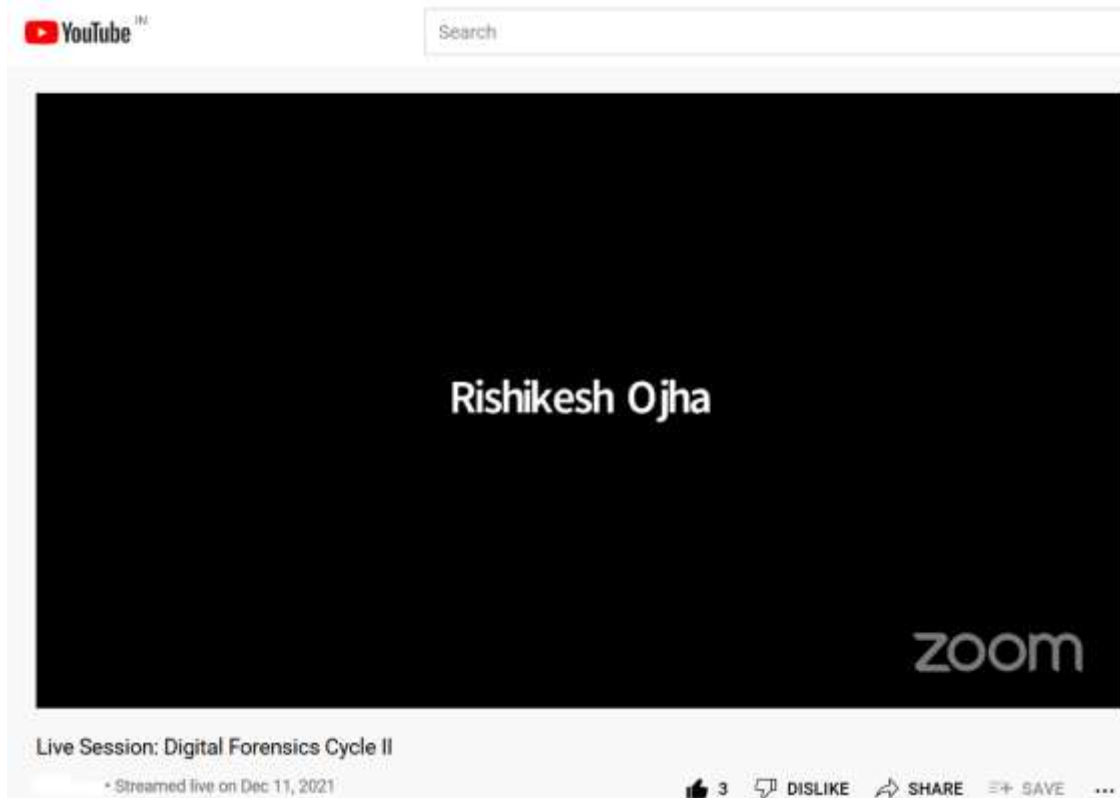
The first live session held on 27th November, 2021 was attended by 100+ participants through ZOOM and the session was broadcasted on Youtube.



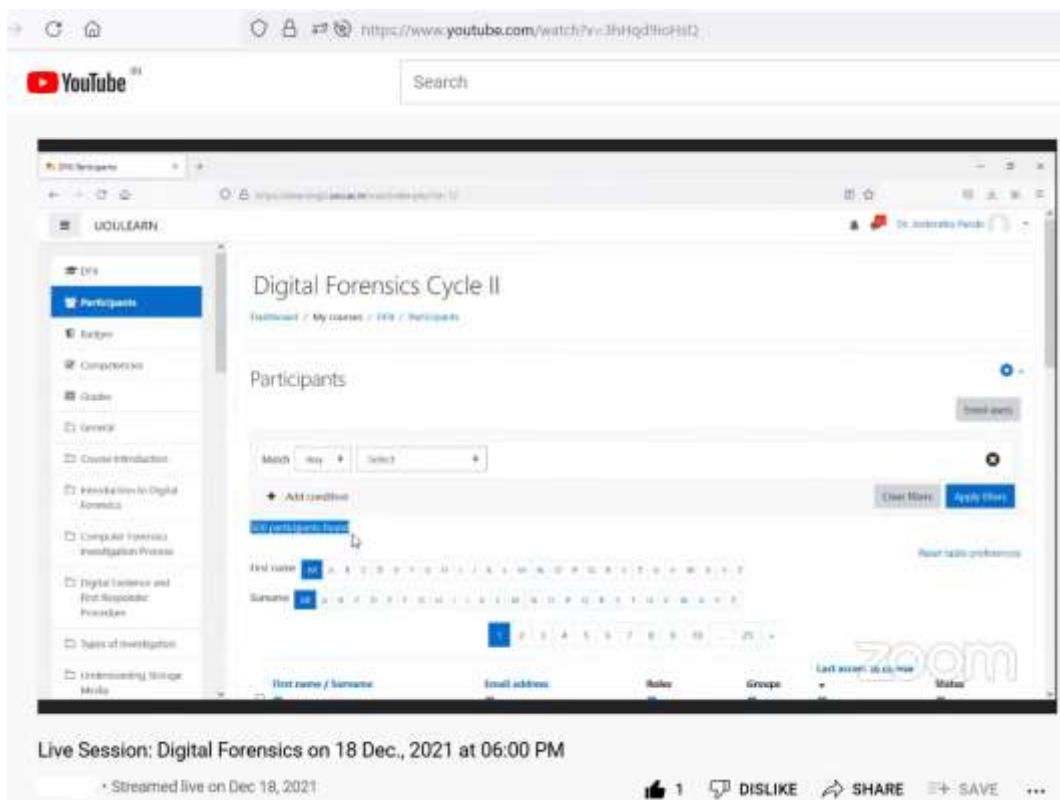
The second live session held on 4th December, 2021 was attended by 100+ participants through ZOOM and the session was broadcasted on Youtube.



The third live session held on 11th December, 2021 was attended by 100+ participants through ZOOM and the session was broadcasted on Youtube.



The fourth live session held on 18th December, 2021 was attended by 75+ participants through ZOOM and the session was broadcasted on Youtube.



Quizzes

The course has four quizzes and it was mandatory to score 50% or more in all the four quizzes individually in unlimited attempts. The quiz consists of MCQ type of assessment with no negative marking.

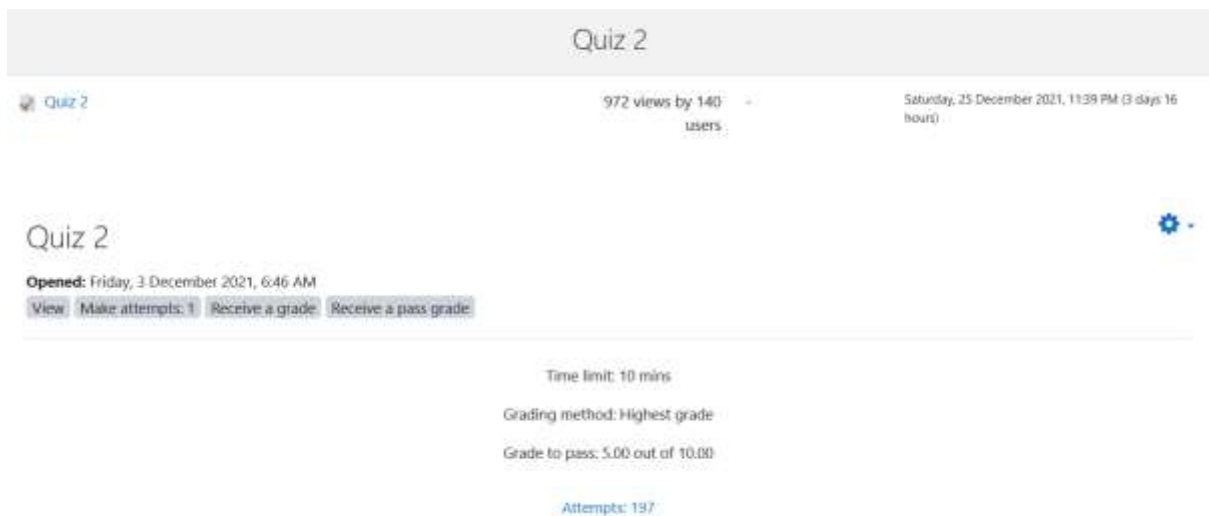
S. No.	Quiz	No. of questions	Total time	Max. Score	Min. max to clear the quiz
1	Quiz 1	10	10 mins	10	05
2	Quiz 2	10	10 mins	10	05
3	Quiz 3	10	10 mins	10	05
4	Quiz 4	10	10 mins	10	05

Quiz 1 has total 1099 views by 142 users. Total number of attempts for Quiz 1 is 211.



The screenshot shows the details for Quiz 1. At the top, it says "Quiz 1". Below that, it displays "1099 views by 142 users" and "Saturday, 25 December 2021, 11:53 PM (3 days 16 hours)". There are buttons for "View", "Receive a grade", and "Receive a pass grade". The quiz settings are listed as: "Time limit: 10 mins", "Grading method: Highest grade", and "Grade to pass: 5.00 out of 10.00". The number of attempts is shown as "Attempts: 211".

Quiz 2 has total 972 views by 140 users. Total number of attempts for Quiz 2 is 197.



The screenshot shows the details for Quiz 2. At the top, it says "Quiz 2". Below that, it displays "972 views by 140 users" and "Saturday, 25 December 2021, 11:39 PM (3 days 16 hours)". There are buttons for "View", "Make attempts: 1", "Receive a grade", and "Receive a pass grade". The quiz settings are listed as: "Time limit: 10 mins", "Grading method: Highest grade", and "Grade to pass: 5.00 out of 10.00". The number of attempts is shown as "Attempts: 197".

Quiz 3 has total 734 views by 112 users. Total number of attempts for Quiz 3 is 150.

QUIZ 3

QUIZ 3 734 views by 112 users Sunday, 26 December 2021, 12:03 AM (3 days 16 hours)

Quiz 3

View Make attempts: 1 Receive a grade Receive a pass grade

Time limit: 10 mins
Grading method: Highest grade
Grade to pass: 5.00 out of 10.00

Attempts: 150

Quiz 4 has total 5072 views by 804 users. Total number of attempts for Quiz 4 is 1014.

QUIZ 4

QUIZ 4 725 views by 110 users Sunday, 26 December 2021, 12:07 AM (3 days 16 hours)

Quiz 4

Opened: Monday, 13 December 2021, 12:00 AM

View Receive a grade Receive a pass grade

Time limit: 10 mins
Grading method: Highest grade
Grade to pass: 5.00 out of 10.00

Attempts: 146

Preview quiz now

Feedback

After the completion of the online training program on Digital Forensics, all the participants have to fill the feedback form. The Course Feedback activity was viewed 452 times by 131 users and the feedback form was filled by 121 participants.

FEEDBACK

Feedback 452 views by 131 users Saturday, 25 December 2021, 11:27 PM (3 days 16 hours)

Overview

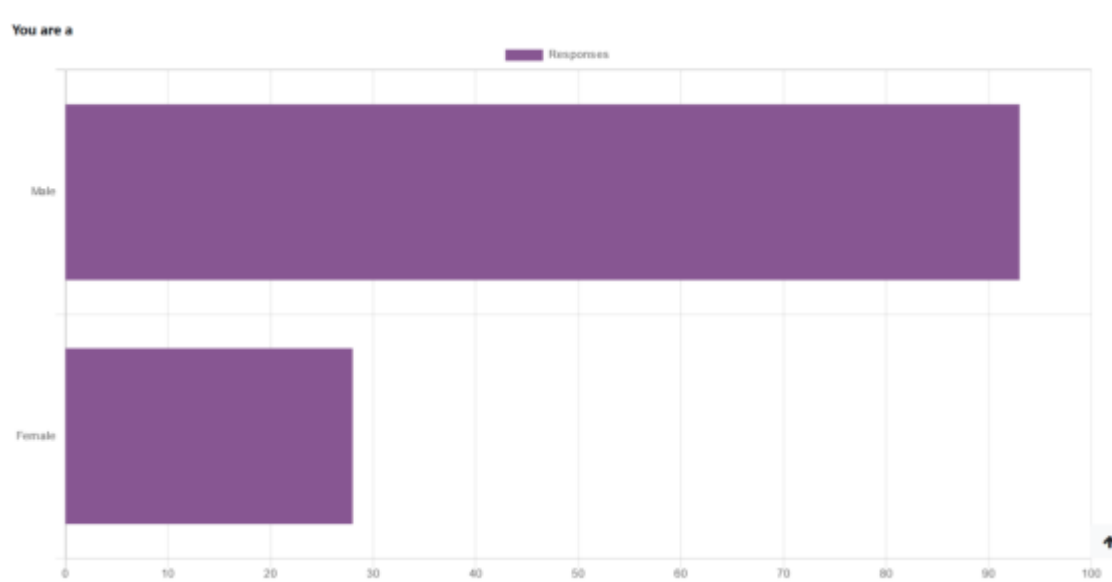
Submitted answers: 121

Questions: 45

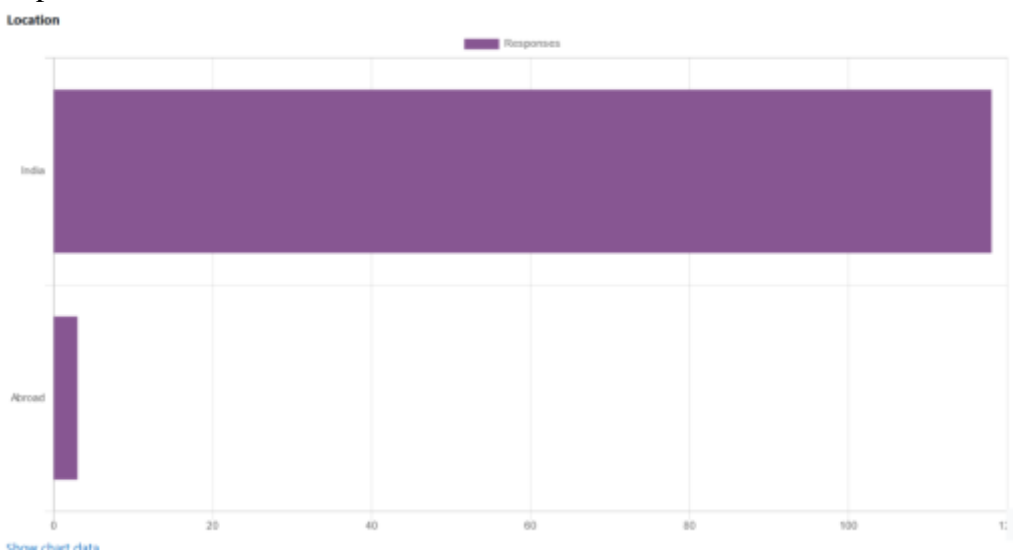
Completion message

Thanks for your feedback. You will be able to Download the certificate on 9th Aug, 2021 onwards.

Out of total 121 respondents, 93 (76.86 %) participants are Male and 28 (23.14 %) are Female. The course has nearly three time Male participants as compared to the Female.



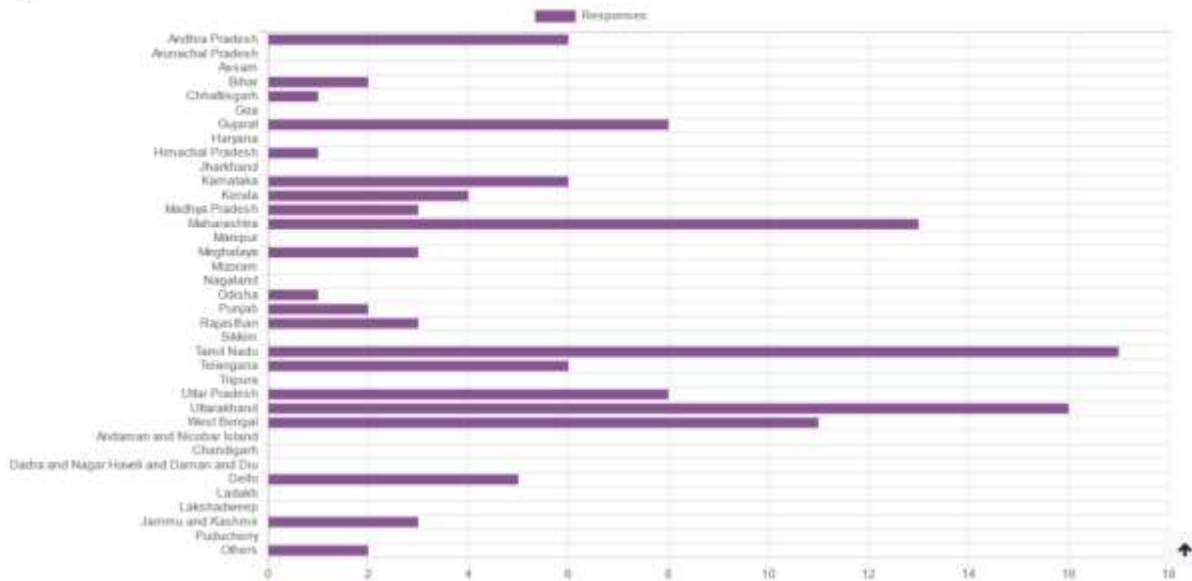
Most of the respondents were from India 118 (97.52 %). Interestingly there are 3 (2.48 %) respondents outside India.



The survey has respondents from almost all the States and Union Territories The details of the representation from each Indian States and Union Territories are as follows:

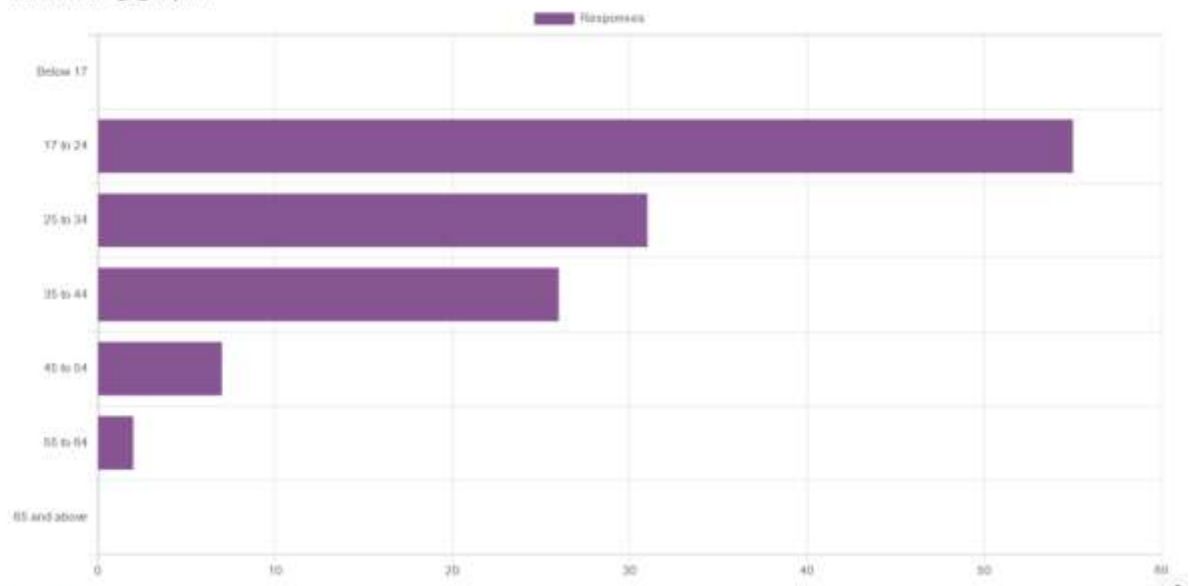
Andhra Pradesh	6 (4.96 %)
Arunachal Pradesh	0
Assam	0
Bihar	2 (1.65 %)
Chhattisgarh	1 (0.83 %)
Goa	0
Gujarat	8 (6.61 %)
Haryana	0
Himachal Pradesh	1 (0.83 %)
Jharkhand	0
Karnataka	6 (4.96 %)
Kerala	4 (3.31 %)
Madhya Pradesh	3 (2.48 %)
Maharashtra	13 (10.74 %)
Manipur	0
Meghalaya	3 (2.48 %)
Mizoram	0
Nagaland	0
Odisha	1 (0.83 %)
Punjab	2 (1.65 %)
Rajasthan	3 (2.48 %)
Sikkim	0
Tamil Nadu	17 (14.05 %)
Telangana	6 (4.96 %)
Tripura	0
Uttar Pradesh	8 (6.61 %)
Uttarakhand	16 (13.22 %)
West Bengal	11 (9.09 %)
Andaman and Nicobar Island	0
Chandigarh	0
Dadra and Nagar Haveli and Daman and Diu	0
Delhi	5 (4.13 %)
Ladakh	0
Lakshadweep	0
Jammu and Kashmir	3 (2.48 %)
Puducherry	0
Others	2 (1.65 %)

State

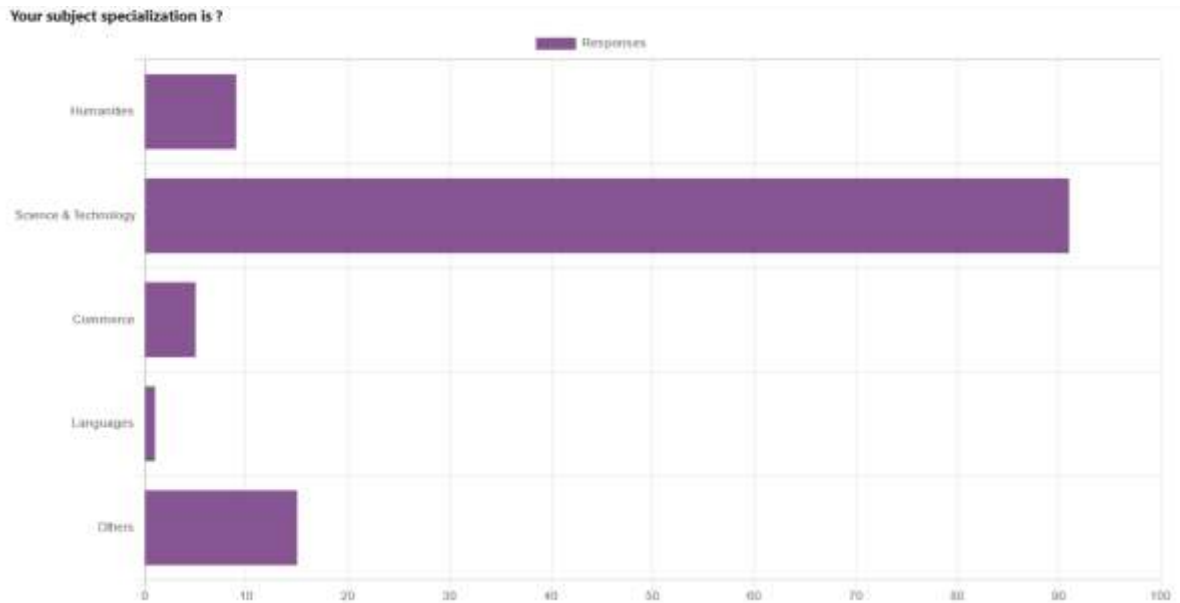


The data revealed that most of the respondents 55 (45.45 %) are in the age group under 17 to 24, while about one forth 31 (25.62 %) are between 25 to 34 age group, followed by 26 (21.49 %) respondents from 35 to 44 age group. 45 to 54 age group have 7 (5.79 %) respondents. Interestingly there is only 2 (1.65 %) respondents from 55 to 64 age group. There is no participation from above 65 age group and below 17 age group.

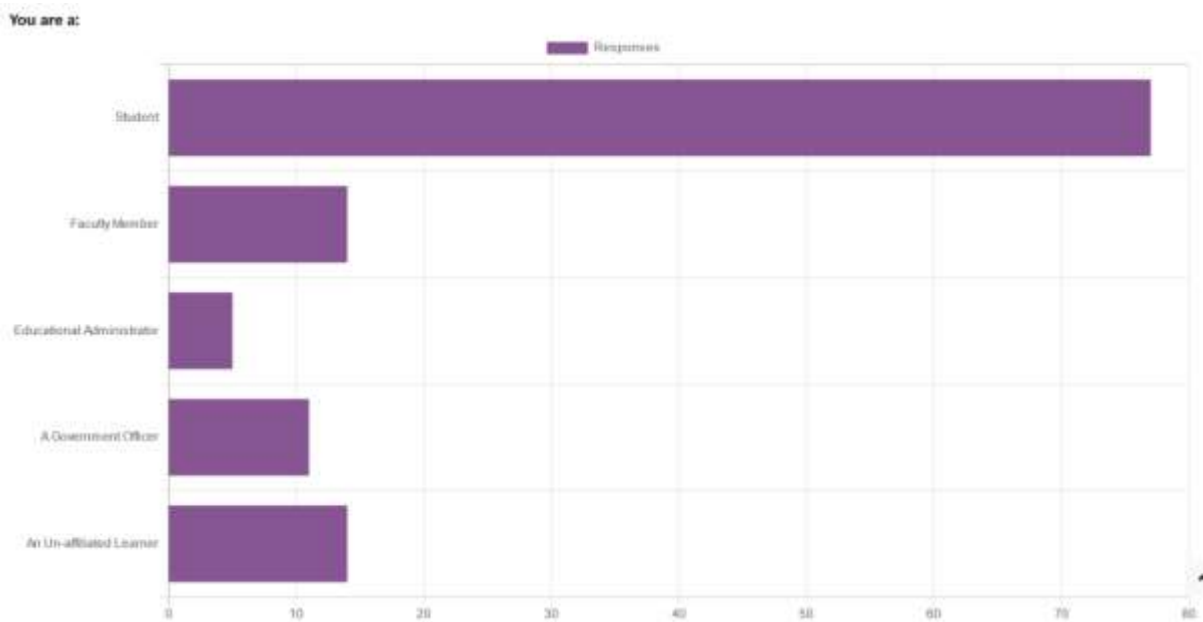
You are in the age group of:



The data revealed that more than half of the respondents 91 (75.21 %) were from Science & Technology discipline, while 5 (4.13 %) of them were from Commerce. Humanities discipline is covered by only 9 (7.44 %) respondents. The least number of respondents 1 (0.83 %) are from Languages. There are 15 (12.40 %) respondents from Others discipline.



The respondents were not only the students 77 (63.64 %), but Faculty Members 14 (11.57 %), Government Officers 11 (9.09 %) and Educational Administrators 5 (4.13 %). There is a good number of un-affiliated 14 (11.57 %) respondents also.



The respondents were asked questions related to the Instructor to Learner Interaction, Instructor Support, Instructor Feedback, Learner to Learner Interaction, Course Content, Course Structure, Information Delivery Technology, Perceived Effectiveness and Learner Retention of the online training program on Digital Forensics and the items were measured and analysed on a 5-point scale from 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for

strongly agree. The questioner is adopted from “Exploring the factors affecting MOOC retention: A survey study¹” which is available under a Creative Commons license.

S.No.		Total	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Average
1	I felt free to ask questions throughout this course	121	55.37%	41.32%	3.31%	0.00%	0.00%	4.52
2	The instructor responded to my questions in a timely manner	121	44.63%	49.59%	4.96%	0.00%	0.83%	4.37
3	The instructor was easily accessible to me	121	47.11%	48.76%	4.13%	0.00%	0.00%	4.43
4	I felt free to express and explain my own views throughout this course	121	47.93%	45.45%	6.61%	0.00%	0.00%	4.41
5	The instructor played an important role in facilitating learning in this course	121	56.20%	42.98%	0.83%	0.00%	0.00%	4.55
6	The instructor contributed to the discussions in this course	121	52.07%	43.80%	3.31%	0.83%	0.00%	4.47
7	The instructor was actively helpful when students had problems	121	48.76%	47.11%	4.13%	0.00%	0.00%	4.45
8	I have interacted with the instructor in this course	121	34.71%	47.11%	12.40%	4.13%	1.65%	4.09
9	The instructor emphasized relationships between and among topics	121	47.93%	48.76%	3.31%	0.00%	0.00%	4.45
10	The instructor was responsive to student concerns	121	50.41%	46.28%	1.65%	1.65%	0.00%	4.45
11	The instructor provided timely feedback on assignments, exams or projects	121	50.41%	42.98%	6.61%	0.00%	0.00%	4.44
12	The instructor provided helpful timely feedback on assignments, exams or projects	121	43.80%	49.59%	6.61%	0.00%	0.00%	4.37
13	I felt as if the instructor cared about my individual learning on this course	121	42.98%	49.59%	5.79%	0.83%	0.83%	4.33
14	The group work contributed significantly to this course	121	36.36%	45.45%	15.70%	2.48%	0.00%	4.16
15	Group size was appropriate for course purposes	121	36.36%	46.28%	16.53%	0.83%	0.00%	4.18
16	Student interaction was an important learning component of this course	121	44.63%	42.98%	8.26%	4.13%	0.00%	4.28
17	This course provided an opportunity to learn from other students	121	42.98%	49.59%	4.13%	3.31%	0.00%	4.32
18	I had sufficient opportunity to interact with other students on this course	121	39.67%	45.45%	12.40%	2.48%	0.00%	4.22
19	This course effectively challenged me to think	121	56.20%	40.50%	1.65%	1.65%	0.00%	4.51
20	Course assignments were interesting and stimulating	121	53.72%	42.15%	3.31%	0.83%	0.00%	4.49
21	This course was up-to-date with developments in the field	121	48.76%	49.59%	1.65%	0.00%	0.00%	4.47
22	Student evaluation techniques such as projects, assignments, and exams were related to the learning objectives of this course.	121	44.63%	49.59%	5.79%	0.00%	0.00%	4.39
23	This course included applied learning and problem solving	121	53.72%	41.32%	4.13%	0.83%	0.00%	4.48
24	The structure of the modules was well prepared and organized	121	57.85%	41.32%	0.83%	0.00%	0.00%	4.57
25	Projects/assignments were clearly explained	121	48.76%	45.45%	4.96%	0.83%	0.00%	4.42

¹ Kate S. Hone, Ghada R. El Said, Exploring the factors affecting MOOC retention: A survey study, Computers & Education, Volume 98, 2016, Pages 157-168,

26	I understood what was expected of me	121	51.24%	45.45%	3.31%	0.00%	0.00%	4.48
27	The interactive content of this course was effectively communicated	121	52.89%	42.98%	4.13%	0.00%	0.00%	4.49
28	The interactive content of this course included information not covered in printed material of the same course	121	35.54%	44.63%	13.22%	4.96%	1.65%	4.07
29	The interactive content of this course contributed towards learning	121	52.89%	46.28%	0.83%	0.00%	0.00%	4.52
30	I have learned a lot in this course	121	61.16%	38.02%	0.83%	0.00%	0.00%	4.6
31	I would recommend this course to friends/colleagues	121	61.98%	37.19%	0.00%	0.00%	0.83%	4.6
32	I have enjoyed taking this course	121	62.81%	36.36%	0.83%	0.00%	0.00%	4.62

The average responses of the respondents follow between 4.62 to 4.07 which indicated positive agreement of them towards the items related to Instructor to Learner Interaction, Instructor Support, Instructor Feedback, Learner to Learner Interaction, Course Content, Course Structure, Information Delivery Technology, Perceived Effectiveness and Learner Retention.

Instructor to Learner Interaction

The average responses of the respondents follow between 4.52 to 4.37 which indicated positive agreement of them towards the items related to Instructor to Learner Interaction. Most of the respondents reported that they felt free to ask questions throughout this course (Avg: 4.52). They reported positively in response to the question where they were asked about the timely response of the instructor responded to their questions (Avg: 4.37). They agreed that the instructor was easily accessible to them (Avg: 4.43). They also felt free to express and explain their own views throughout this course (Avg: 4.41).

Instructor Support

The average responses of the respondents follow between 4.55 to 4.09 for the items related to Instructor Support. They agreed that the instructor played an important role in facilitating learning in this course (Avg: 4.55). They also reported positively to the item which enquired about the instructor contributed to the discussions in this course (Avg: 4.47). They also reported that the instructor was actively helpful when students had problems (Avg: 4.45). Most of the respondents have interacted with the instructor in this course (Avg: 4.09). They also reported that the instructor emphasized relationships between and among topics (Avg: 4.45).

Instructor Feedback

The average responses of the respondents follow between 4.45 to 4.33 for the items related to Instructor Feedback. They reported positively that the instructor was responsive to student concerns (Avg: 4.45). They also reported positively that the instructor provided timely feedback on assignments, exams or projects (Avg: 4.44). Similarly, the instructor provided helpful timely feedback on assignments, exams or projects (Avg: 4.37). Additionally, respondents admitted that they felt as if the instructor cared about their individual learning on this course (Avg: 4.33).

Learner to Learner Interaction

The average responses of the respondents follow between 4.32 to 4.16 for the items related to Learner-to-Learner Interaction. The participants agreed that the group work contributed significantly to this course (Avg: 4.16). They also felt that Group size was appropriate for course purposes (Avg: 4.18). The respondents admitted that Student interaction was an important learning component of this course (Avg: 4.28). The respondents accepted that this course provided an opportunity to learn from other students (Avg: 4.32). Similarly, they had sufficient opportunity to interact with other students on this course (Avg: 4.22).

Course Content

The average responses of the respondents follow between 4.32 to 4.16 for the items related to Course Content. Most of the respondents felt that this course effectively challenged me to think (Avg: 4.51). They also reported positively that course assignments were interesting and stimulating (Avg: 4.49). They admitted that this course was up-to-date with developments in the field (Avg: 4.47). They also accepted that Student evaluation techniques such as projects, assignments, and exams were related to the learning objectives of this course (Avg: 4.39). They also agreed that this course included applied learning and problem solving (Avg: 4.48).

Course Structure

The average responses of the respondents follow between 4.57 to 4.42 for the items related to Course Structure. Most of the respondents reported that the structure of the modules was well prepared and organized (Avg: 4.57). They also admitted that the projects/assignments were clearly explained (Avg: 4.42). They also understood what was expected of them (Avg: 4.48).

Information Delivery Technology

The average responses of the respondents follow between 4.52 to 4.07 for the items related to Information Delivery Technology. The respondents reported that the interactive content of this course was effectively communicated (Avg: 4.49). They also accepted that the interactive content of this course included information not covered in printed material of the same course (Avg: 4.07). Additionally, they also agreed that the interactive content of this course contributed towards learning (Avg: 4.52).

Perceived Effectiveness

The average responses of the respondents follow between 4.6 to 4.62 for the items related to Perceived Effectiveness. They agreed that they have learned a lot in this course (Avg: 4.6). The respondents were also willing to recommend this course to friends/colleagues (Avg: 4.6). Most of the respondents accepted that they have enjoyed taking this course (Avg: 4.62).

Out of total 121 respondents, 108(89.26 %) reported that they completed the MOOC to earn a credential signifying official completion.

Question	Yes	No
Did you complete the MOOC to earn a credential signifying official completion?	108 (89.26 %)	13 (10.74 %)

Out of the respondents who dropped the course, 5(4.13 %) respondents reported that they dropped the course within first few days, 2(1.65 %) of them dropped within first few weeks, 6 (4.96 %) towards the middle of the course, 5 (4.13 %) towards the end of the course and 7(5.79 %) respondents dropped the course just before the end.

Question	Not applicable, as I officially completed the course	First few days	First few week	Towards the middle	Towards the end	Just before the end
If no, when did you drop out?	96 (79.34 %)	5 (4.13 %)	2 (1.65 %)	6 (4.96 %)	5 (4.13 %)	7 (5.79 %)

101(83.47 %) respondents completed all the exercises/assessments in the MOOC, 12(9.92 %) completed most of the exercises/assessments, 3(2.48 %) completed almost half, 4(3.31 %) respondents completed a few exercises/assessments and 1(0.83 %) participant reported that they not completed none of the exercises/assessments in the MOOC.

Question	All	Most	Around Half	A few	None
How many exercises/assessments did you complete in the MOOC?	101 (83.47 %)	12 (9.92 %)	3 (2.48 %)	4 (3.31 %)	1 (0.83 %)

In response to the item “How much of the MOOC content do you estimate you watched or read?”, 80(66.12 %) respondents reported that they have watched/ read all the contents of the MOOC, 31(25.62 %) reported they watched/ read most the contents, 4(3.31 %) reported around half, 5(4.13 %) reported a few and 1(0.83 %) respondents reported that they have watched/ read none the contents of the MOOC.

Question	All	Most	Around Half	A few	None
How much of the MOOC content do you estimate you watched or read?	80 (66.12 %)	31 (25.62 %)	4 (3.31 %)	5 (4.13 %)	1 (0.83 %)

After completing all the mandatory requirements for successfully completing the online training program, 105 participants downloaded the certificate.

Digital Forensics Cycle II

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Download Certificate

Recipients: 105



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Mr. Ketan Joglekar, Assistant Professor, GJ College, Maharashtra



Dr. Ashutosh Kumar Bhatt, Associate Professor, Uttarakhand Open University, Haldwani



Dr. Sangram Panigrahi, Assistant Professor, Siksha 'O' Anusandhan, Bhubaneswar

Course starts from 22 November,2021. The exact dates shall be



communicated to registered participants

COURSE FEE

Free

COURSE START DATE

22 November, 2021

COURSE REGISTRATION LINK

<https://forms.gle/xmVSVc4EBGRm637g8>



This MOOC has been prepared with the support of



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